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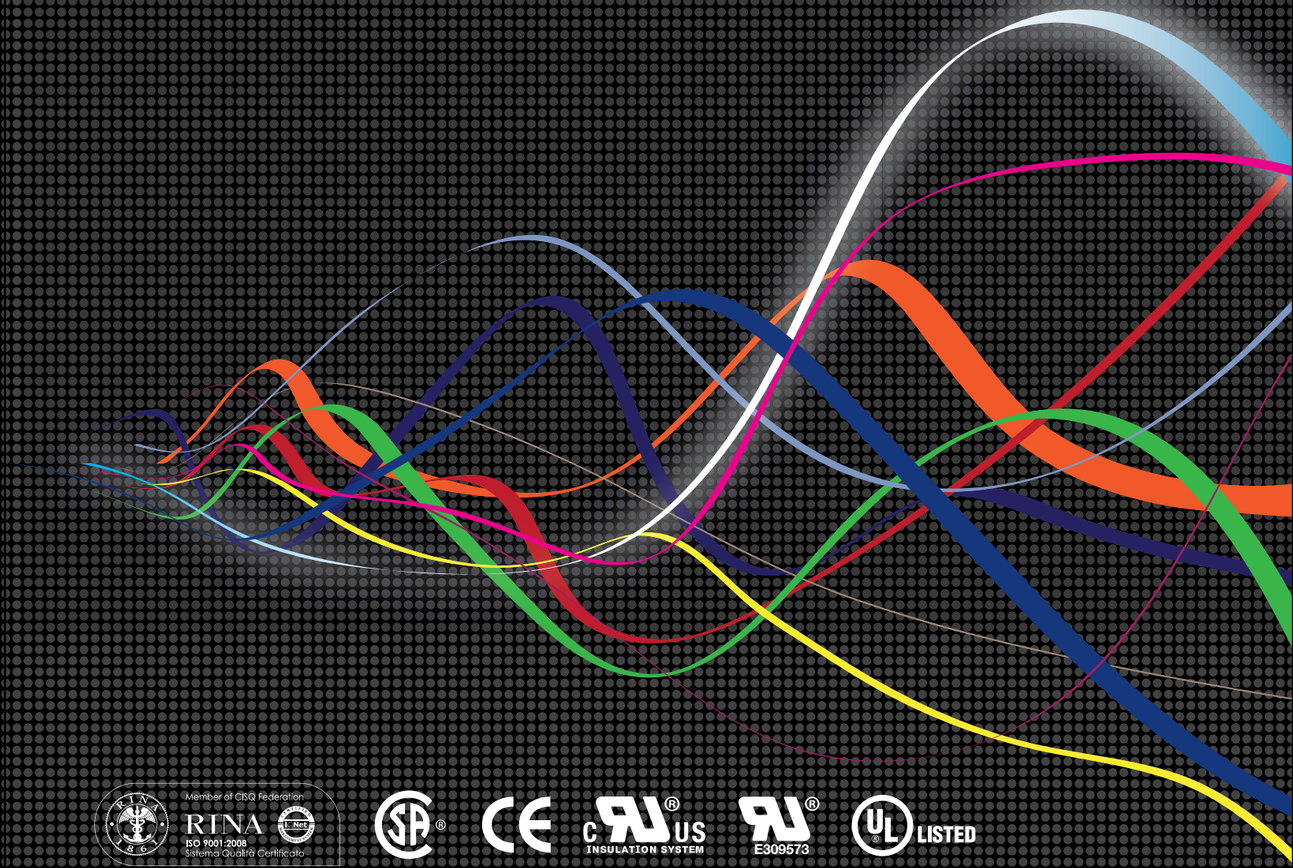
Totally Focused On

World-class Synchronous Alternators



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INSULATION SYSTEM E309573

LISTED

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Focusing on

World-class Synchronous Alternators

Mecc Alte is an innovative and dynamic company that is proud to be the largest independent producer of synchronous alternators. Quite simply, we manufacture the world's widest range of low voltage alternators through 'made for manufacturing' product designs. We have proven expertise and experience in design, low cost manufacturing, complete research and development capabilities. With global manufacturing taking place in Italy, UK, India and China – coupled with high market capabilities and a powerful global capacity, we can offer a fast and reliable service to our customers... all over the world.

There are six main reasons why we're a world-leading producer and supplier in our market sectors.

- We only make one kind of product. This means that we're always totally focused on producing high quality synchronous alternators.
- Our company is totally independent. That's why we never compete with any of our customers in the end market.
- We believe in the power of partnerships. Consequently, we always aim to be the most reliable partner for companies working in the energy field.
- We do it all. From the design and personalisation of high quality synchronous alternators right through to solutions to technical problems and after-sales assistance.
- We're strategically focused. We offer a single range from 1 to 3000kVA, from portable alternators to machines for industrial use.
- We do everything ourselves. We have complete control over our sales and distribution and absolute control over all the components we use.

Focusing on

Our Italian Heritage, Experience and Expertise

Mecc Alte was established in 1947 in Alte, Vicenza, Italy and has continuously evolved from its humble beginnings into a global brand in the 21st Century.

Our strategic decision in the early 70s to specialise in only producing alternators has allowed us to attain a leading global position in the electromechanical field.

The Carraro family has retained sole ownership and, as an independently owned private company, has focused on achieving the highest possible levels of specialisation, quality and service. We concentrate on servicing our customers and, what's more, we never compete with them in the end market.

Mecc Alte is in the business of transforming mechanically generated energy into electrical energy – so we only sell alternators. We are proud to be a flexible and fast acting company and our 100% ownership of our supply and distribution channels gives us complete control in the market place.

We have over 60 years experience. We know what is needed from the industry we serve and we aim to provide it.

mecc alte — Industrial & Marine Products

eurogen — Portable 2 Pole Products 1–15kVA

zanardi — Welders & Specialised Products

Focusing on

Our Three Leading Brands

The Mecc Alte group consist of three leading brands:

The Mecc Alte Group consist of three leading brands which, between them, cover all market sectors.

This wide coverage ensures that we can meet the power needs of all of our customers – throughout the world.

mecc alte

Industrial & Marine Products

Our main brand – a manufacturer and supplier of synchronous alternators 4 pole from 5kVA through to 3000kVA and 2 pole alternators 5kVA to 2000kVA.

- 6-3000kVA
- 1phase brushless – Capacitor for light towers
- Slipring/Compound in 2 & 4 pole up to 20kVA
- Brushless compound in 2 & 4 pole to 82kVA with AVR option
- Brushless AVR in 2 & 4 pole to 2500kVA
- 400Hz up to 400kVA
- 6 pole alternators
- Specialised Technologies
- Variable Speed
- Permanent magnet generators
- Generators for renewable applications (water and wind turbine)

eurogen

Portable 2 Pole Products 1–15kVA

A company that specialises in the volume manufacturing of small 2 pole portable units 1.2kVA to 15.5kVA.

- 1phase brushless capacitor excited units with optional AVR or Brush + AVR
- 3phase with slipring compound control or Brush + AVR

zanardi

Welders & Specialised Products

A factory specialising in customised power solutions making tailor made specialised alternators and welding generators.

- 2 & 4 pole welding alternators with auxiliary output
- AC 130-220a and 200-500a DC
- Special products tailored to meet customers requirements
- Water-cooled, DC, Lighting, Total-enclosed, Variable speed, Short units
- Asynchronous alternators
- Wound component parts
- Permanent magnet generators

Focusing on

Our Applications

As a specialised manufacturer of synchronous alternators/welders and special rotating machines, within the electromechanical sector, we can produce products that cover a highly diverse range of applications.

In addition to a very broad 'standard' product range, we can also meet specific customer requirements. We build a wide variety of specialised alternator products, which include 400Hz, water-cooled, DC, Variable Speed, Totally Enclosed and Wind Power.

Within general Industry, our products are used in the following applications:

- Prime Power
- Cogeneration
- UPS
- Commercial Construction
- Rental
- Parallel Operation
- Peak Shaving
- Telecommunications
- Mining
- Irrigation
- Hospitals
- Homes

and many other continuous or standby power applications.

Experienced sub divisions cater for Rail, Marine and 400Hz specialisms.

Mecc Alte is a leading supplier to the marine genset market. Applications include: small water-cooled 4kW machines in the leisure boat industry, larger fully certified machines up to 2640kVA used in simple power supply, emergency/auxiliary, main power on large vessels and bow thruster drives on others.

Please see the Mecc Alte Marine Mini Guide for further details.

Our proven record in reliability and maintainability has established Mecc Alte as a leading player within the Rail industry. We supply specialised products for vehicle mounted power supply/traction and maintenance Vehicles. With a specialist range of IP56 alternators specifically designed for rail applications.

Please see the Mecc Alte Rail mini Guide for further details.

Our 400Hz alternator range is predominantly used in the aircraft ground support market. We are able to offer units for ground power supplies from small 5kVA 14 pole units through to large 400kVA 26 pole units.

Please see the Mecc Alte 400Hz mini Guide for further details.

In short, we can offer total support and total solutions in order to meet all of your power requirements.

Focusing on

Our Products

We are a well established company that is ready, and able, to challenge all of the markets in every product sector.

4 Pole Alternator Range						
Series	**Control System**	**1ph 50Hz**	**3phase 50Hz**	**1phase 60Hz**	**3phase 60 Hz**	**Unique Attributes**
LT3/4	Brushless Capacitor Control	3.5 – 8 kVA	-	4.5 – 10kVA	-	Suitable for lighting
BTP3/4	Brush/Slipring Transformer Control	On Request	7 – 15kVA	On Request	8.4 – 18kVA	400% Motor Start
ECP3/4	Brushless AVR control with DSR and MAUX	4 – 10kVA	6.5 – 15kVA	3 – 12kVA	7.8 – 18kVA	Optional DER
ECO28/4		5 – 19kVA	7.8 – 30kVA	6.3 – 23kVA	9.4 – 36kVA	Optional DER
NPE32/4		6.4 – 22.5kVA	7.5 – 27.5kVA	8.4 – 26.5kVA	9 – 34kVA	Space Saver
ECO32/4		24 – 45kVA	35 – 70kVA	23 – 56kVA	42 – 84kVA	Optional DER
ECP34/4		54 – 82kVA	85 – 150kVA	65 – 98kVA	102 – 180kVA	Optional DER
ECO38/4		110 – 212kVA	180 – 350kVA	133 – 254kVA	220 – 420kVA	Optional PMAUX/DER
ECO40/4		245 – 436kVA	400 – 720kVA	295 – 524kVA	480 – 865kVA	Optional PMAUX/DER
ECO43/4		-	800 – 1300kVA	-	960 – 1560kVA	Optional PMAUX/DER
ECO46/4		-	1500 – 2500kVA	-	1800 – 3000kVA	Optional PMAUX/DER
ECSO28/4	Brushless Transformer control with MAUX	5 – 19kVA	17 – 30kVA	13.5 – 23kVA	20.4 – 36kVA	Optional AVIR
ECSO32/4		24 – 45kVA	35 – 70kVA	28 – 56kVA	42 – 84kVA	Optional AVIR

2 Pole Alternator Range						
Series	**Control System**	**1ph 50Hz**	**3phase 50Hz**	**1phase 60Hz**	**3phase 60 Hz**	**Unique Attributes**
BTP3/2	Brush/Slipring Transformer Control	On Request	16 – 20kVA	On Request	19.2 - 24kVA	>400% Motor Start
ECP3/2	Brushless AVR control with DSR and MAUX	5.5 – 11.5kVA	8 – 19kVA	6.6 – 13.8kVA	9.6 – 22.8kVA	
ECO28/2		14.5 – 25.5kVA	22 – 40kVA	17.5 – 30.5kVA	26.5 – 48kVA	
NPE32/2		5.6 – 20 kVA	8 – 32kVA	6.7 – 24 kVA	10 – 38.4kVA	Space Saver
ECO31/2		29 – 54kVA	44 – 52kVA	35 – 65kVA	53 – 99kVA	
ECP34/2		67 – 113VA	100 – 170kVA	80 – 139kVA	120 – 208kVA	
ECP34/2		On Request	800 – 1300kVA	On Request	960 – 1560kVA	
ECP34/2		On Request	1500 – 2500kVA	On Request	1800 – 3000kVA	

Specialised Alternator Range						
Series	**Control System**	**1ph 50Hz**	**3phase 50Hz**	**1phase 60Hz**	**3phase 60 Hz**	**Unique Attributes**
Rail – TE34	Brushless AVR control with DSR and MAUX	On Request	50 – 80kVA	On Request	60 – 96kVA	Totally Enclosed IP54
Marine	Brushless AVR control with DSR and MAUX	On Request	7.8 – 2500kVA	On Request	8.4 – 3000kVA	Optional DER & on large units PMAUX
400Hz – HC Series	HC series multipole brushless with DSR and MAUX (400Hz)		5.5 – 400kVA			400Hz (14, 20, 24 & 26 Pole)
ECO43/6	Brushless AVR control with DSR and MAUX		533 – 897kVA		630 – 1070kVA	6 Pole
ECO46/6			1071 – 1812kVA		1285 – 2170kVA	6 Pole

All the above ratings for guidance only please refer to technical ratings book for confirmation.

Focusing on

Manufacturing Process

We are a volume producer with complete control over our factories and have a truly international manufacturing base.

Our facilities cover over 51.300m^2. We have over 800 employees and over 30 CNC controlled robots. We continue to invest in our future through increasing global capacity and this ensures that we are able to support the growth of our clients. We can react to any market demands and always ensure that we can instantly maximise any growth opportunities for our customers.

Every alternator we produce is made with highly selected materials and components – all tested in conformity to ISO9001 quality specification.

Our production process consists of various stages of advanced manufacturing technologies. Each working phase is carried out using state-of-the-art equipment to ensure high performance, great reliability and precision. Robotic machining and winding operation processes enable the highest degree of precision which ensures maximum results in consistent quality. Operating to a an effective environmental management system we have also achieved ISO14001 which helps us minimise our impact on the environment.

- **Italy – Mecc Alte Spa:** Producing Alternators from 1-3000kVA 2, 4 and 6 pole
- **UK – Mecc Alte UK:** From 7kVA to 1300kVA 4 pole
- **China – Mecc Alte Haimen:** Producing from 7kVA through to 3000kVA
- **India – Mecc Alte India:** Produces 6.4kVA to 84kVA 4 pole alternators
- **Italy – Eurogen:** Manufacturing Portable Alternators 1-15.5kVA 2 pole
- **Italy – Zanardi:** Producing Specialised Products and Welding Alternators

With an integrated supply chain (we also own our own lamination factory) and 100% ownership of our sales and worldwide distribution, we are perfectly positioned to professionally serve all world markets... and further enhance our reputation as a global leader in alternator manufacturing.

Focusing on

The ECO and ECP Range

Our extensive experience in the power generation industry as well as our diligent studies and thorough research has led to the development of our ECO and ECP alternator range.

The versatility of our products and their solid design means that our ECO and ECP series are formed to meet the traditional requirements of industry and the high technological specifications of applications such as telecommunications, cogeneration, military and other demanding market sectors.

Our ECO and ECP alternators are available with a 50 or 60Hz frequency, either with 2 poles ranging from 8-114kVA or with 4 poles ranging from 6.5 to 3000kVA. They are available either as single bearing or as twin bearing with a double support. In order to couple them to a prime mover it is possible to choose among a wide range of flanges and couplings.

All alternators consist of a fixed stator with skewed slots and a rotating inductor fitted with a damper cage (except for the ECO3N and ECO28N alternators which do not have a damper as standard). All alternator windings have a 2/3rd pitch in order to reduce harmonic content. The entire series is manufactured according to, and complies with, the most common specifications such as CEI 2-3, IEC 34-1, EN 60034-1, VDE 0530, BS 4999-5000, CAN/CSA-C22.2 No14-95-No100-95. Special versions are available, on request, to meet specific conditions or regulations.

4 Pole Alternator Range				
Series	**1ph 50Hz**	**3phase 50Hz**	**1phase 60Hz**	**3phase 60Hz**
ECP3/4	4.3 – 9.7kVA	6.5 – 15kVA	5.2 – 11.6kVA	7.8 – 18kVA
ECO28/4	3.9 – 18.4kVA	7.8 – 30kVA	4.7 – 23kVA	9.4 – 36kVA
ECO32/4	23 – 44kVA	35 – 70kVA	27 – 54kVA	42 – 84kVA
ECP34/4	52 – 80kVA	85 – 150kVA	63 – 95kVA	102 – 180kVA
ECO38/4	112 – 216kVA	180 – 350kVA	135 – 259kVA	220 – 420kVA
ECO40/4	243 – 437kVA	400 – 720kVA	296 – 534kVA	480 – 865kVA
ECO43/4	–	800 – 1300kVA	–	960 – 1560kVA
ECO46/4	–	1500 – 2500kVA	–	1800 – 3000kVA
2 Pole Alternator Range				
ECP3/2	5.5 – 11.5kVA	8 – 19kVA	6.6 – 13.8kVA	9.6 – 22.8kVA
ECO28/2	15 – 21kVA	23 – 31kVA	17.5 – 25kVA	26 – 38kVA
ECO32/2	29 – 54kVA	44 – 83kVA	35 – 65kVA	53 – 99kVA
ECP34/2	67 – 113VA	100 – 170kVA	80 – 139kVA	120 – 208kVA
ECO37/2	On Request	158 – 300kVA	On Request	188 - 450kVA
ECO43/2	On Request	500 – 1000kVA	On Request	580 - 1100kVA

Why are our products so popular with so many users?

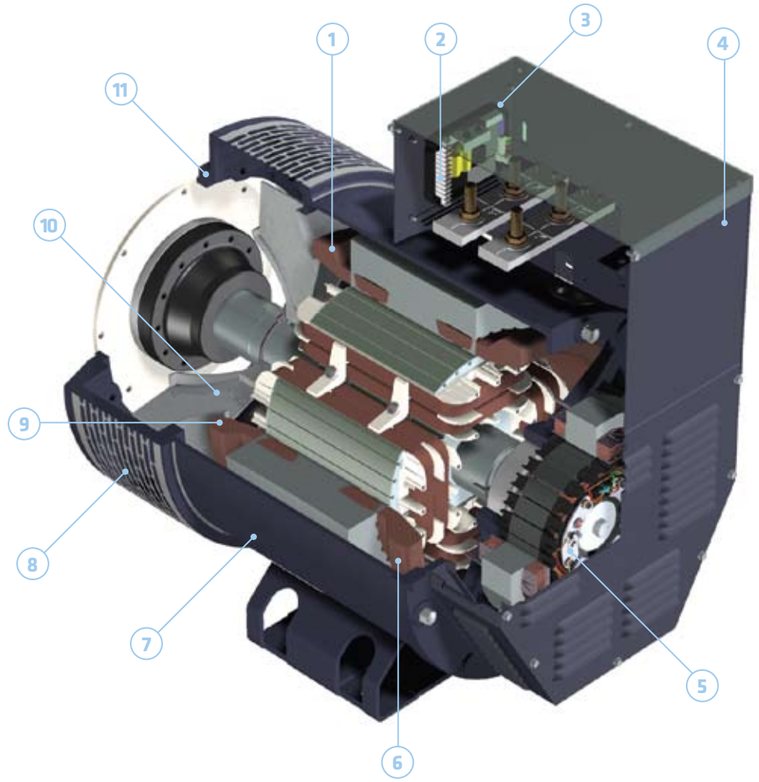
- Our 'made for manufacturing' design and advanced manufacturing technologies reduce the production processes and ensure consistent quality.
- Our alternators are designed to ensure optimum efficiency which enables the customer to maximise outputs and fuel economies.
- Efficient design ensures that our alternators have a high output to weight ratio. They are manufactured to ensure the shortest and lightest design to minimise space requirements.
- Our products are reliable and robust and can be used in many diverse applications without fear of failure.
- Our highly flexible accessories mean that customers can retro fit and minimise their stocks. (One product can fill a multitude of requirements).
- Our design systems are uncomplicated and our machines use common components – making serviceability easy.
- We fit a MAUX Auxiliary System into every product. This ensures 300% motor starting capacity for 20 Seconds (or 300% short circuit capability.) It is capable of handling both linear and non linear loads.
- Digital Regulators come as standard. They sense true RMS with voltage accuracy of +/- 1% and an abundance of additional features.

Focusing on

General Product Features

The ECO and ECP range has many product features designed into the alternator. Self-regulation is obtained through a digital electronic regulator that is fed by an auxiliary winding. We guarantee an almost constant supply from the generator – under any possible operating condition.

A rotating inductor is fitted with a damper cage (except for the ECO3N and ECO28N alternators). The windings have a 2/3 pitch in order to reduce the harmonic content of voltage. The entire series is manufactured according to, and complies with, the most common specifications such as CEI 2-3, IEC 34-1, EN 60034-1, VDE 0530, BS 4999-5000, CAN/CSA-C22.2 No14-95-No100-95. Special versions are available on request to meet specific specifications and regulations.



List of Features:

01. Low reactance stator
02. DSR – digital regulator with multiple settings and real time memory, logging any faults in operation
03. Single regulator used throughout the range
04. Innovative design with low weight and compact size
05. Easy access to check diodes
06. MAUX system auxiliary winding as standard providing >300% short circuit current
07. Rugged design (withstands up to 7G)
08. Magnetic FEM designed windings for maximum efficiency
09. MAUX System offers dedicated and isolated power supply to the DSR regulator
10. 2/3rds pitch winding to eliminate triplen harmonics
11. Flexible design accommodates many winding voltages and many coupling types

Mechanical Structure

The robust mechanical structure permits easy access to the connections and components during routine maintenance check-ups. The materials used in the mechanical structure are: FEP12 steel for the frame, C45 steel for the shaft and cast iron for the end-brackets. The standard degree of alternator protection is IP21 or IP23. Other higher degrees of protection, such as IP45 and IP54 etc. are available on request.

Insulation and Impregnation

Insulation is of class H standard. Impregnation is made with premium tropicalised epoxy resins by dipping and dripping. High voltage parts are impregnated by vacuum, so the insulation level is always very good. In the high-power models, the stator windings undergo a second insulation process. Grey protection is now standard on larger power machines where an additional layer of grey EG43 varnish is applied on the main and exciter stator to give enhanced protection. Other special treatments for particular environmental conditions are available on request. Such as total protection or total plus protection which uses a black flexible compound to give the ultimate winding treatment. This assures superior performances in harsh or demanding environments.

(Please refer to insulation protection systems handbook for more information).

Voltage Accuracy

The voltage accuracy is ±1% in static condition with any power factor and with speed variation between 5% and +30% with reference to the rated speed.

Voltage Regulation

The voltage can be regulated by the Volt potentiometer on the electronic regulator or by an external control device, commonly used by the Gen Set industry to govern the genset. With the digital DSR it is possible to control the range of voltage control, avoiding any possible trouble that can be made by unskilled personnel.

Transient Voltage and Response Times

At a full load and no load, at constant speed there is a transient voltage variation lower than 15% of the rated voltage. In such conditions the 3% voltage resetting will occur in 0.2 seconds for powers up to 300KVA, while for higher powers it will occur in 0.3 seconds. (Make reference to the user's manual for more detail).

Overload

The permissible overloads are of 300% for 20 seconds, of 50% for 2 minutes and of 10% for 1 hour every 6 hours of operation.

Parallel Operation

Eco alternators with dampers (>35kVA) can function in parallel among themselves, not withstanding the type of alternator and/or in parallel with the mains provided they are equipped with a droop transformer. This device is available upon request for the alternators up to type 38, while the alternators with a higher power are equipped with this as standard equipment. In case of parallel with the mains, we offer the P.F.R. 96/1 electronic device which controls the alternators reactive current and/or power factor of the alternator.

Radio Interference Suppression

The standard generators comply with the specification VDE 0875, degree "K" and the basic safety requirements of the European regulation on electromagnetic compatibility. By applying the European standards EN 60034-1, we comply with the above mentioned regulation. Upon request we are available to study and produce EMC filters according to more restrictive specifications.

Focusing on

Innovative Product Features

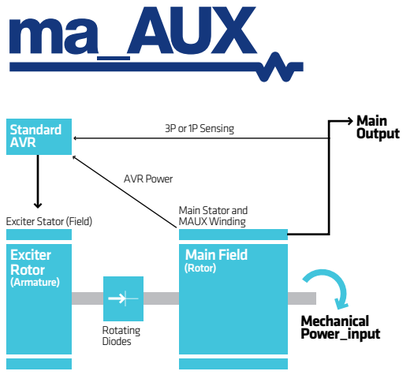
We are at the forefront of technological advancement and design and have built in many advanced features that make our generators stand out from the crowd.

AUXILIARY WINDING

ma_AUX (Mecc Alte Auxiliary)

The MAUX Mecc Alte Auxiliary Winding is a separate winding within the main stators that feeds the regulator. This winding enables every one of our alternators to take an overload of 300% forced current (short circuit maintenance) for 20 seconds. This is ideal for motor starting requirements.

Customers can be assured that they can maximise efficiencies and minimise alternator sizes when considering motor start applications. In addition, rather than adding length and extra weight by adding a PMG (an additional permanent magnet generator on the end of your alternator) customers can just fit a standard Mecc Alte which matches the performance and is capable of supporting both linear and distorted loads. This delivers a more compact, efficient, lighter and intelligent solution to your motor starting requirement.

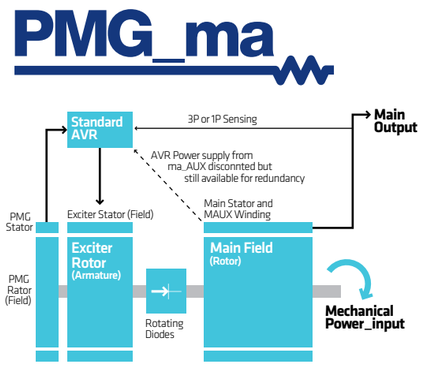


PMG/PERMANENT MAGNET GENERATOR

PMG_ma (Permanent Magnet Auxiliary)

Mecc Alte pioneered the technological benefits of the MAUX. However, some traditional users still occasionally request a Permanent Magnet Generator option. (A PMG is an additional pilot excitation system derived from a permanent magnet generator driven from the main alternator shaft). Our philosophy is to use uncomplicated systems which meant that, until the introduction of the digital regulator, we would require several different AVR's and consequently could see no benefit in offering a PMG option.

However, with the digital regulator we are now able to offer optional PMG on the standard Mecc Alte products starting from 180kVA. The PMAUX Permanent Magnet Auxiliary system allows the fitting of a kit which adds a PMG onto the existing generator. This means that the MAUX auxiliary can act as a back up in times of trouble. There is no need to change the AVR, a kit can be kept in stock and retro fitted to our alternators above 180kVA.



DSR (Digital Regulator)

The DSR is an advanced AVR replacing the traditional automatic voltage regulator. This voltage regulator is fully digital controlled and is fitted as standard across all our ECO and ECP, 2 and 4 pole units.

Connections on the DSR are through 15 fast on fast off connectors which speed up the connection process. This is especially useful if reconnecting a 12 wire machine to any specific voltage. This regulator is cross compatible with all ECO and ECP machines and can be used as standard with the MAUX system and the PMAUX systems, so there's never any need to change regulators. Its single phase sensing comes as standard but, should three phase sensing be needed, it is possible through linking with an additional external board.

Technically it can work from – 25°C up to 70°C and uses voltage sensing on true Root Mean Square (RMS) value, which is ideal for both linear and distorted loads. Voltage regulation accuracy is +/- 1%, from 15Hz to 72Hz. Its 50 or 60Hz compatible as there is a hardware jumper for the 60Hz operation or within the digital software settings. We have endeavored not to over complicate enabling the DSR to also be operated mechanically. We not only have the digital setting points for, Voltage, Amps, Stability and Hz but also have kept the potentionmeters to enable mechanical adjustments for the more traditional users.

We've kept the under-speed protection but added an adjustable threshold and scope level. In addition, protection of excitation over-current is also included by means of an accurate thermal model of the generator rotor. Other clever features include an accurate management of short-circuit. If the short circuit is not interrupted by an external protection device, the DSR stops the excitation and reboots the system preventing overload generator failure for an extended period when compared to standard analogue regulators. These settings, which allow the generator to cool down, can be set up to 25.5 seconds or even disabled should you already have your own protection in place. This regulator allows accurate management of a synchronous motor starting.

By means of the external communication board (DL1), computer connection (RS232 or USB) or PLC connection (RS485 via MODBUS) are available. This allows changes to the AVR settings, to monitor in real time performances (Voltage, Frequency or DSR status), or to download the alarm report. (communication software is available from Mecc Alte).

So what can we monitor?

Self operational start up checks the DSR, checks it is working in the right state Over Voltage/Under Voltage/Short Circuit/Over Excitation/Under Speed/ Over Speed. If the above alarms are triggered the active protection output of the DSR will protect the alternator, and emit a warning light. You can set it to trip out when one or more alarms are triggered. In addition events are recorded in the internal memory capable of storing up to 136 years of data. This will precisely record the alarm type, number of events recorded and the total duration of each alarm. Linked with an internal clock you can closely monitor loading and its effects and see what is happening to your alternator.

DER (Digital Enhanced Regulator)

The DER gives you the same performances as the DSR but with the addition of having the three phase sensing built in as standard and a higher voltage precision.

Focusing on

Our Other Industrial Ranges

We are a specialised manufacturer and have additional alternator ranges to meet specific market requirements. These are just some of our additional industrial product lines.

BTP Range
The BTP range is characterised by a compound type regulation, with a brush/slipring and transformer control they offer a high pick up capacity of 450% offering unrivalled performance in motor start requirements.

ECSO Range
The ECSO range is a brushless transformer controlled 4 pole industrial range that enables a motor start capability of > 400% forced current for 20 seconds. You can also fit an optional automatic voltage regulator the AVIR which improves the voltage regulation from +/-4% to +/- 1.5% while still retaining the existing performance characteristics.

NPE Range
The NPE range uses all the same technologies of the ECO and ECP range. They are brushless and controlled with the standard DSR regulation and MAUX system but have been designed as compact as possible. This space saving range are made as small as possible to allow minimal space impact.

LT3 Range
The LT3 alternator range is available as 1500rpm 50Hz or 1800rpm 60Hz, 1 phase. These machines are designed as brushless with capacitor control. Due to their operating system and low running speed they are a product leader in the lighting tower market, as they are especially suited to run metal halide lights.

4 Pole Alternator Range				
Series	**1ph 50Hz**	**3phase 50Hz**	**1phase 60Hz**	**3phase 60Hz**
LT3	3.5 – 8kVA	–	4.5 – 10kVA	–
BTP3/4	On Request	7 – 15kVA	On Request	8.4 – 18kVA
NPE32/4	6.4 – 22.5kVA	7.5 – 27.5kVA	8.4 – 26.5kVA	9 – 34kVA
ECSO28/4	11.3 – 18.4kVA	17 – 30kVA	14 – 22kVA	20.4 – 36kVA
ECSO32/4	23 – 44kVA	35 – 70kVA	27 – 54kVA	42 – 84kVA
2 Pole Alternator Range				
BTP3/2	On Request	16 – 20kVA	On Request	19.2 – 24kVA
NPE32/2	5.6 – 20 kVA	8 – 32kVA	6.7 – 24 kVA	10 – 38.4kVA

BTP Range

ECSO Range

NPE Range

LT3 Range

Focusing on

Operational Considerations

We are proud that our alternators have many features built in as standard. This enables them to be used in a multitude of applications and environments.

We encourage our customers to understand where the alternator will be used and to consider the implications of its operating environments. This will enable us to recommend the correct alternator and to suggest any additional processes or requirements that may need to be considered to extend the alternator's performance and lifespan.

If an alternator is to be operated outside the normal temperature and altitude parameters of 40°C ambient (and 1000m above sea level) then the following de-rates must be applied.

In addition, other considerations should be made if a machine is to be operated in harsh environments. We can supply additional protection levels such as IP43, IP45 and even IP54 in some cases. If the environment is humid we can supply anti-condensation heaters. We can also upgrade the insulation protection system and offer alternative solutions such as GREY EG43 severe environment protection or TOTAL Protection with a black rubber coating. This is supplied on the winding for the harshest of environments. *(See Insulation systems manual)*

	Operating Ambient Temperature				
Operating Altitude	**25°C**	**40°C**	**45°C**	**50°C**	**55°C**
< 1000m	1.07	1	0.96	0.93	0.91
1000m to 1500m	1.01	0.96	0.92	0.89	0.87
1500m to 2000m	0.96	0.91	0.87	0.84	0.83
2000m to 3000m	0.9	0.85	0.81	0.78	0.76

Focusing on

Our Accessories Range

Our customers can be confident that they can specify a product suitable for a given application. Therefore, if required, we can offer a large range of accessories that can be fitted to our alternators to further enhance performance.

Parallel Operation – On request, it is possible to install parallel operation equipment.

PFR96/2

The "power factor regulator" type PFR 96/2 designed and manufactured by Mecc Alte is a piece of electronic equipment that when fitted to our generators type ECO and ECP, allows control of the reactive current and/or power factor of machines working in parallel with the grid, thus allowing the maximum utilisation of the plants. PFR96/2 is housed in a DIN standard aluminium box allowing easy fitting into the control panel. *(Fig 1)*

Parallel Device PD 300/400

The PD parallel device is a unified module allowing ECO generators to operate in parallel among themselves with the typical voltage drop or with constant voltage. It also allows to operate in parallel with the grid eventually with the addition of PFR96/2 PD is fitted as standard on generators series 40 – 43 – 46; for the other series it is available on request.

(see parallel operation manual for further information)

Environmental Considerations – In considering the operational environment the following accessories may be required.

Anti Condensation Heaters

Our whole range can be fitted with anti condensation heaters of adequate power sized to alternator kVA. Voltage for heaters must be specified when ordering. *(Fig 2)*

(please see our Thermal probes and heaters manual for further information)

Radio Interference Suppressors (RIS)

Mecc Alte generators comply with the main standards of radio suppression. To comply with even more restrictive standards such as Mil STD 461 upon the customer's request, it is necessary to fit special filters in the generators, which Mecc Alte is able to design and manufacture.

Intake Air Filters

Environmental conditions for our generators are extremely diversified. There are some very restrictive standards concerning the protection degree of machines that, in certain circumstances must be applied. Mecc Alte studied a protection system to be fitted on the machines to comply with protection degrees IP43 and IP45 of IEC standards.

Totally Enclosed Units

Although not available as an accessory to retro fit we can offer totally enclosed machines. These comply with IP54 and IP56 protection standards.

Advanced Insulation Systems

We use class H insulation protection as standard, but with an additional coating of grey EG43 varnish, that is a high temperature insulating enamel we further protect your machine against moisture and chemical ingress. This GREY protection level is now standard for machines above 85kVA. If you find an even harsher and more demanding environment it is possible to even further enhance this level of insulation protection. The TOTAL protection level uses a black flexible compound which is the ultimate winding treatment and offers superior protection in really harsh or demanding environments. This rubber like protection encapsulates the windings and seals them from moisture and chemical attack. In addition it is also resistant to particle abrasion as it deflects any impacts. On some machines a de-rate is applied if this option is applied.

(please see the insulation protection systems handbook for further detail)

Thermal Protection – On request, it is possible to install one of the following devices as thermal protection.

PTC Thermistors

These components (which are indicated in the standard equipment of the 38 – 40 – 43 – 46 type generators) are assembled in the heads of the stator windings they are usually set to trip at 150DegC. When the pre-set temperature is reached the thermistors emit a signal that can be used by a trigger device (not included) to protect the generator. *(Fig 3)*

Thermal Resistors.

PT100

The resistance of this device varies proportionally to the temperature of the winding where it is assembled. If combined with a thermostat (not included) it allows to set the temperature to the desired value at which the whole protection system trips out.

Bimetallic Overload Protections

These devices have a Normally Closed contact that trips immediately when a pre-set temperature is reached. If the temperature decreases, the contact resets automatically.

(please see our Thermal probes and heaters manual for further information)

Figure 1

Figure 2

Figure 3

Additional Equipment – Other useful accessories.

SPD 96/A

The SPD 96/A "remote protection warning device" is an electronic device that, when combined with the UVR6 voltage regulator, shows how the alternator is working from a distant location. It shows the following operating conditions:

- Overload: yellow LED on
- Normal Running: green LED on
- Low Speed: red LED on

When one of the protections has tripped out, it is possible to control other devices by means of an exchange contact.

Furthermore, SPD96/A has an overvoltage and over speed detector. Each detector is connected to an exchange contact which may be connected to external holding circuits preventing these types of troubles. SPD96/A is equipped with a standard anodized aluminium box (DIN 43700 drilling) allowing an easy fit to the control panel. *(Fig 4)*

RBD-1

This is an electronic device which spots the presence of anomalies on the rotating diode bridge (opens diodes, short circuit etc); this accessory is available on request. Anomalies are indicated by a red led as well as by the communication of a relay which, through an exchange contact of 2A 250V, allows the user to obtain signals, alarms or shutdowns. Through an external 12V battery, it is also possible to memorise any anomalies seen. *(Fig 5)*

DIRCI-04

DIRCI-04 is a full digital controlled regulator based on DSP (Digital Signal Processor) that combines functions as Voltage Regulation, Reactive Current or Power Factor Regulation and alternator diagnostic into a single board. It can improve and optimise generator power system performance for any application.

The regulator is supplied with Mecc-Terminal (User-friendly communication interface designed by Mecc Alte) which allows users to work with settings on the DIRCI-04 via their personal computer. MODBUS RS 485 protocol is also available. *(Fig 6)*

DLI- Interface Board

The DI1 interface device permits connection of the DSR digital regulator to home computer or a PLC monitoring device. It can work with RS232, USB or RS485 protocols. If a computer is used, Mecc Alte offers two different software types to monitor and program its Voltage regulators which are the DSR terminal and the DSR reader.

Figure 4

Figure 5

Figure 6

Focusing on

Our Quality, Aftersales and Service

We have reached the highest possible quality standards in every area of design, production and sales. With us, the pursuit of quality begins long before actual production with checks on semi-processed parts and sample tests on electronic components.

These tests are performed with rapid aging methods by means of alternating exposure to extreme temperatures. Our quality is enhanced during the production process with computerised equipment making checks on electronic and electrical circuits. The high quality of our finished products is due to a perfect combination-high performance and maximum reliability. That quality is certified by international bodies such as the Canadian Standards Association (CSA), the Underwriters Laboratories (UL) and Det Norske Veritas (DNV). Further supported by our ISO9001 accreditation from Registro Italiano Navale (RINA).

Every quality mark is a guarantee of the painstaking assessment of prototypes and a commitment to continuous audits by external inspectors to monitor product consistency – and product quality.

This quality assurance allows us to be proud of our products. Our products are now globally recognised. This high market acceptance has originated from a combination of effective marketing through our sales and distribution facilities, established training plans for our many customers, and consistently great aftersales service. We are a professional and responsible company and understand that a good reputation breeds success. We also understand that our reputation depends on continually high standards of support – whenever and wherever it is required. With an extensive global service and aftersales network, you can be assured that your product will be supported anywhere in the world.

Certifications Owned by Mecc Alte

Member of CISQ Federation RINA ISO 9001:2008 Sistema Qualità Certificato

INSULATION SYSTEM E309573 LISTED

Focusing on

Global Communication

We are proud of the relationship that we have with each and every one of our customers. Effective communications with them are an integral part of our operations.

We appreciate the importance of developments in electronic communication and recognise the world wide web as a continually evolving global communication tool. Our website holds up to the minute company and product information. Operating as an online database, customers have access to product and commercial documents and downloads for support 24 hours a day, seven days a week 365 days a year. Visit **www.meccalte.com**

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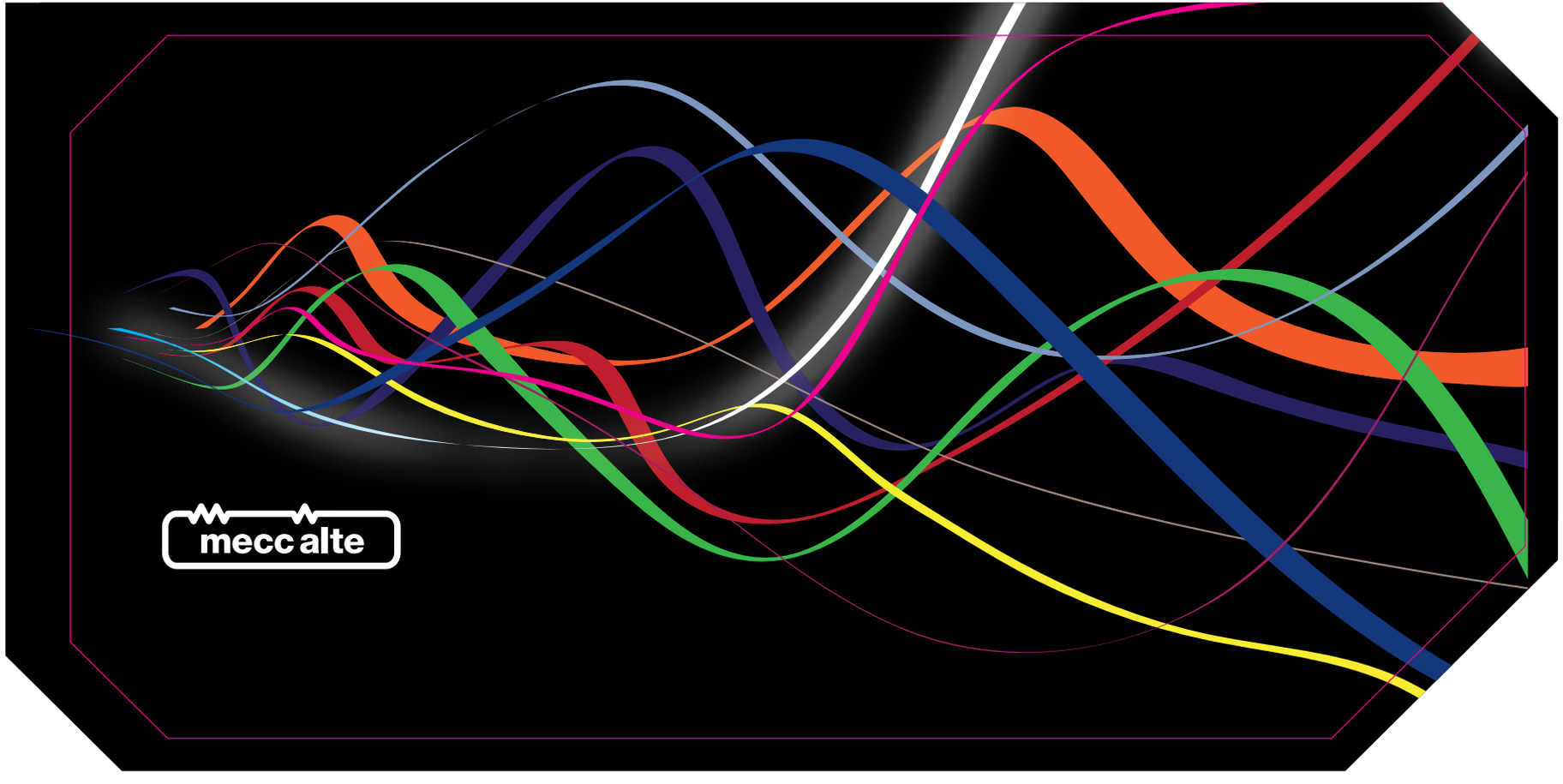
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